Energy Policy
The Interconnection Challenge

CARIMET Workshop- Metrology and Technology Challenges of Climate Science and Renewable Energy

11 April 2015

Factors that drive CO2 Emissions

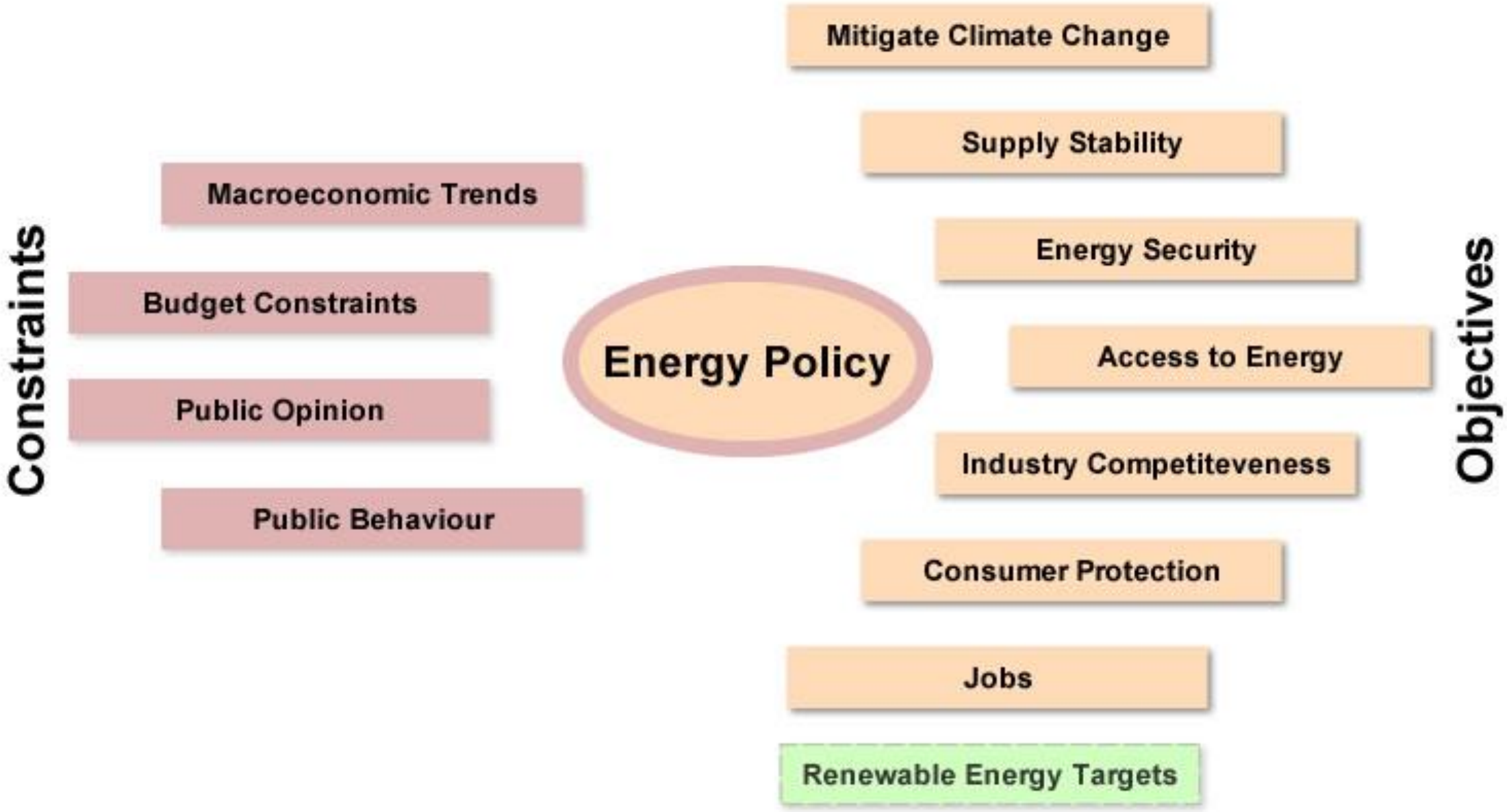
$$CO_2 = P \times S \times E \times C$$

P	S	E	C
People	Energy Services	Energy Efficiency	CO2 per unit Energy

Source : Bill Gates, TED 2013

OWIA

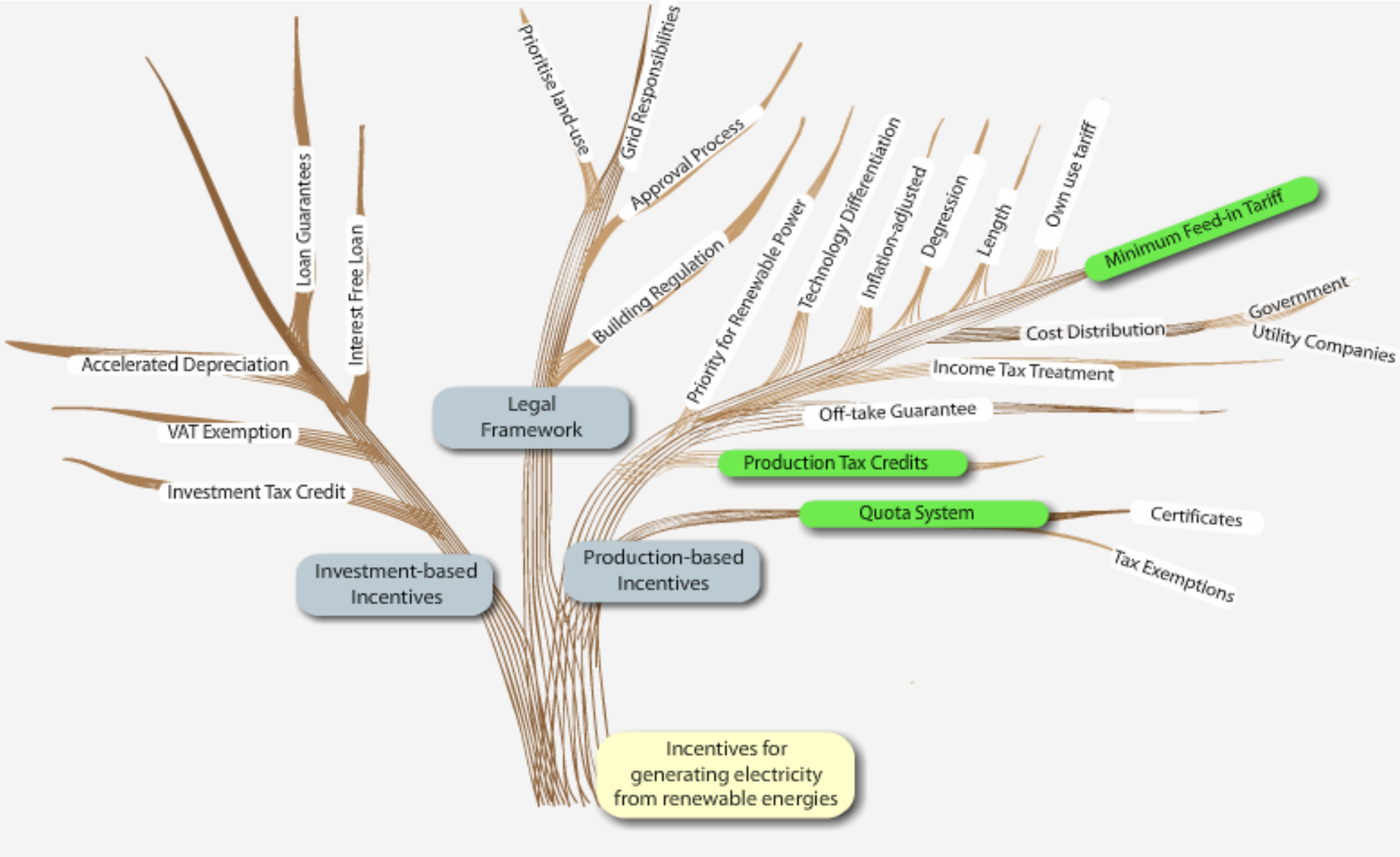
Energy Policy Conundrum



Source: Green Rhino Energy http://www.greenrhinoenergy.com/blog/?p=177g

OWIA

Renewable Energy Policy



Source: Green Rhino Energy http://www.greenrhinoenergy.com/blog/?p=177g

OWIA

Four Pillars of Good- Solar Policy

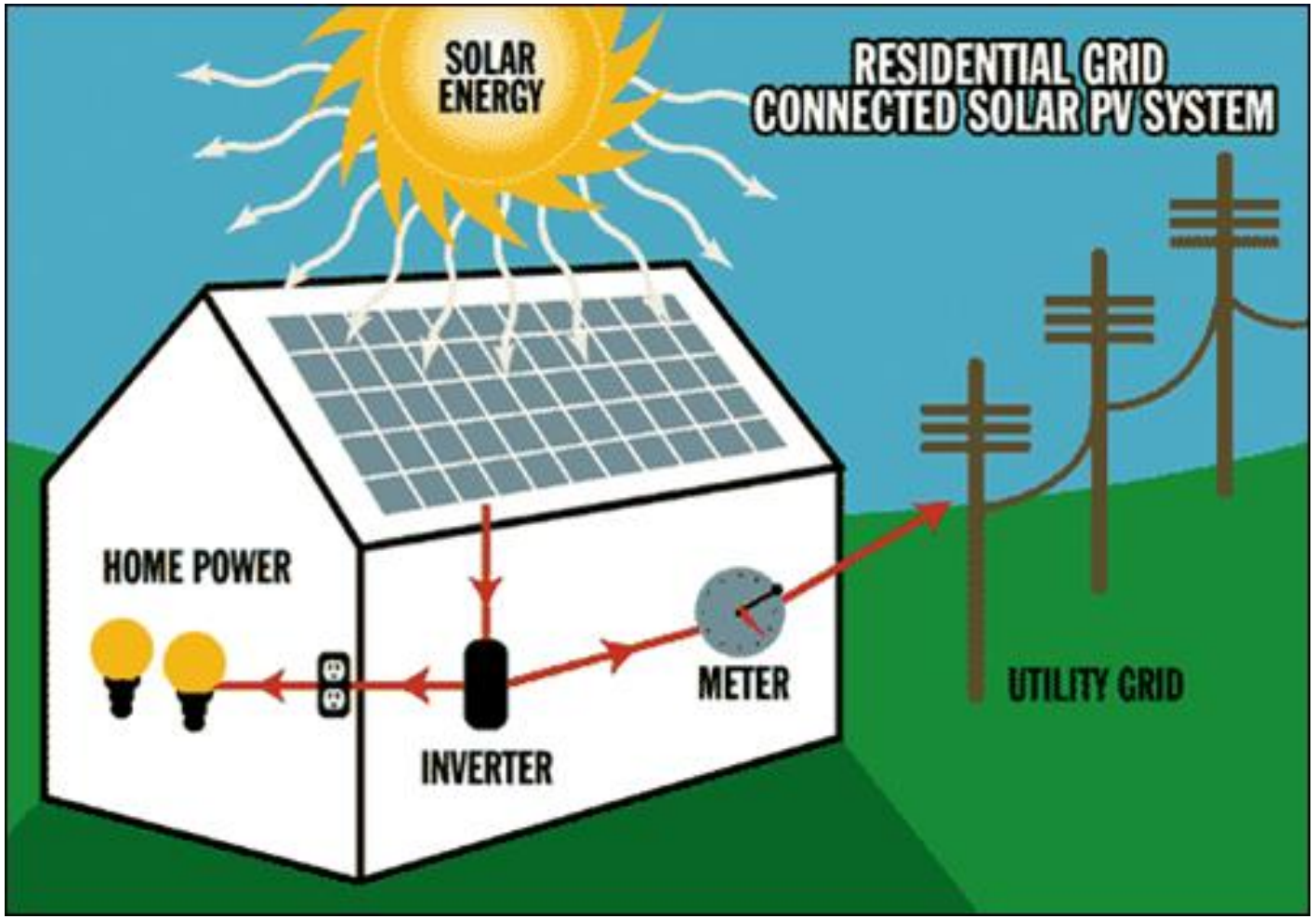
- Standards & Incentives
- **Interconnection.**
- **Net-metering**.
- Utility Rates and Revenue Policies

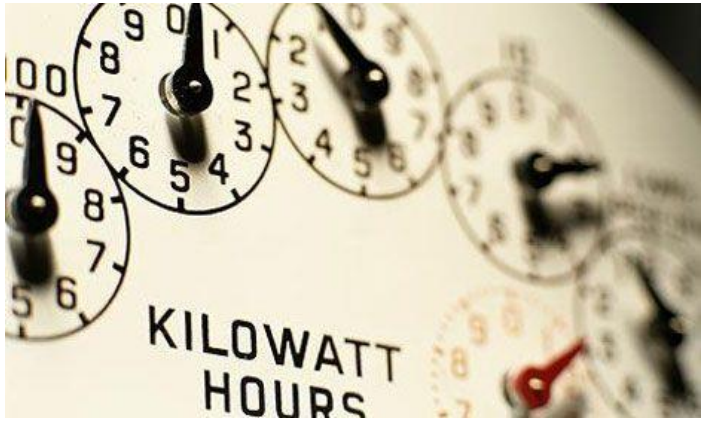
.

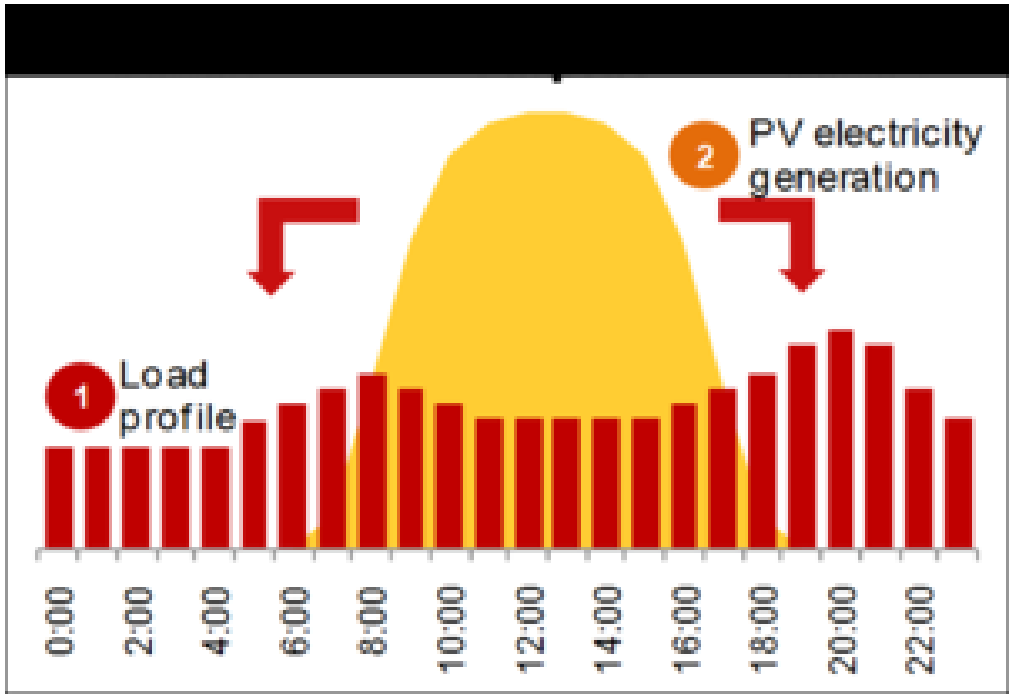
Non Policy issues

- Personal Economic context represented by median household income
- Physical Characteristics of homes and existing network.
- State of the existing grid.
- General community interest in Renewable Energy generally
- The acquisition cost of the technology

Net Energy Metering







OWIA

Where the Rubber meets the Road

- Interconnection and net-metering lead to more robust markets.
- Inconsistency is the nemesis of Clean Energy Development
- **While Financial Incentives are the engine of market development, interconnection and net-metering is the road**.
- States with long-standing best practice interconnection and net metering policies tend to see increases in capacity when layering other incentives on top of those policies
- Individuals should have the right to self-generate.
- Individuals should have the right to sell excess energy.
- Individuals to should have the right to self-consume.

OWIA

Challenges and Questions?

- What effects will RE generation have on Utilities revenues and cost structure?
- How much should customers be paid for self generation and by whom?
- How do utilities attract new investments for the maintenance and upgrading the grid as well as any new generation capacity?
- Do customers have an inherent right to consume the power they produce?
- What are the technical challenges from high penetration of RE on existing networks?
- What new business models and services will emerge with RE increased penetration and how will system reward these services?

OWIA

On-site generation Policies

Country	Policy Mechanism	On-site Consumption?	System size cap	Program cap	Compensation structure	Compensation amount (USD)
Barbados	Renewable Energy Rider	Yes**	1.5x the customer's current avg. usage up to a max. capacity of 150kW	9MW	• Under 2kW: Cash payment for metered output of system. • Over 2 kW: Cash payment for 100% of power	1.6x the Fuel Clause Adjustment
Cayman Islands	CORE Tariff	Yes*	Residential: 20 kW, or peak load	2 MW	Cash payment for 100% of power	~USD $0.47/kWh for 20 years
Grenada	Renewable Standard Offer	No	Commercial: 100 kW, or peak load	2.5% of annual electricity demand	Cash payment for 100% of power	USD $0.17/kWh for 10 years, or avg. avoided fuel cost for previous 12 months
Jamaica	Net Billing Standard Offer Contract	Yes	Residential: 10kW, Comm.: 100kW	2% of JPS' highest system peak	Cash payment for metered output of system	Short-run avoided cost of generation
St. Vincent & the Grenadines	VINLEC Net Billing/FIT policy	Yes***	• Single phase: 17kW • Three phase: 50kW	Max. of 5% of peak demand on certain islands	• Residential: Cash payment for metered output of system. • Commercial: Cash payment for 100% of power	EC $0.45/kWh
USVI	Feed-In Tariff	No	10 – 500kw	15MW (both programs in total)	Cash payment for 100% of power	Percentage discount to the avoided cost of the Utility
	Net Metering	Yes	• Residential: 20kW • Comm.: 100kW • Public Facility: 500kW		Generation credited to the customer-generator's utility account	Retail rate

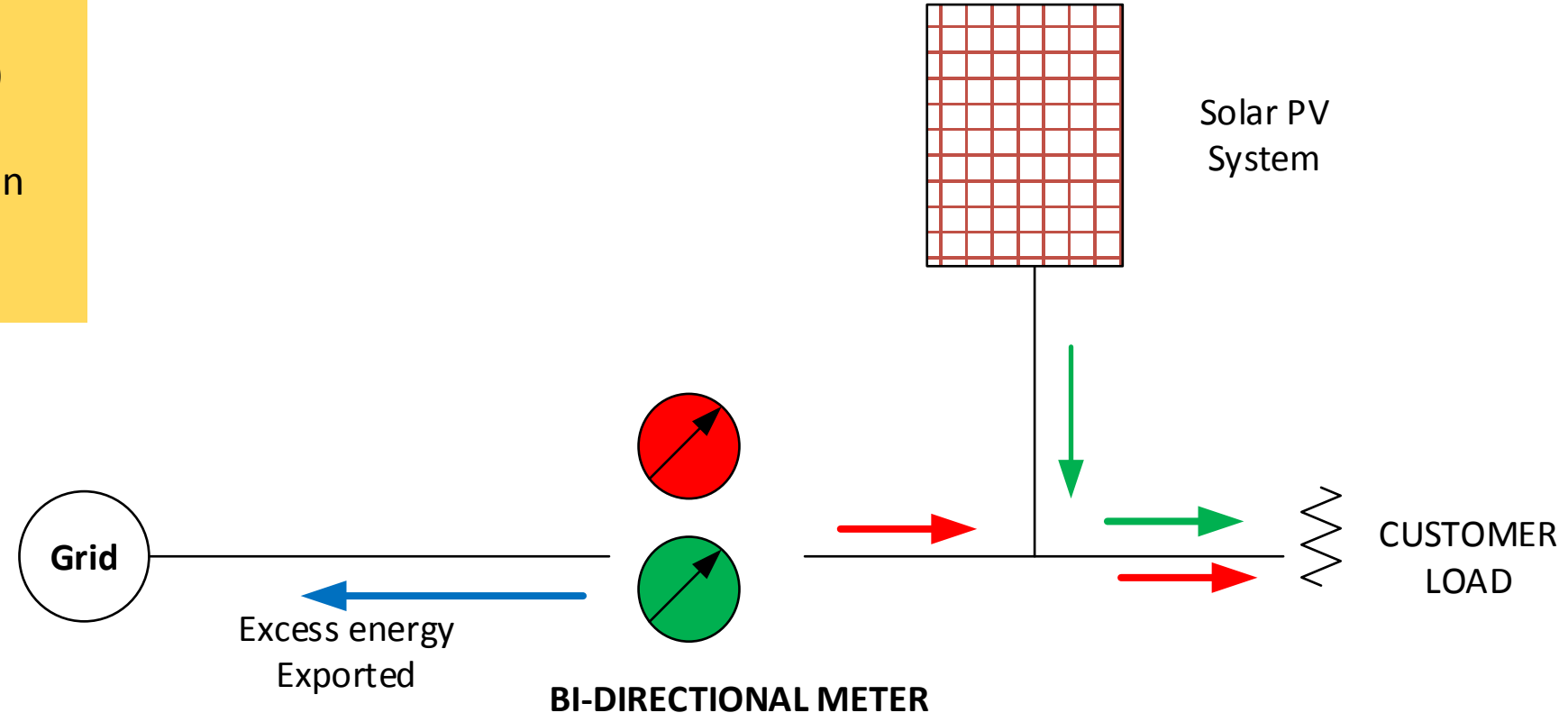
* Power can be consumed on-site but it does not offset retail electricity purchases. Customer pays the utility retail rate for all electricity consumed.
** Systems up to 2kW may choose whether to use a Buy All/Sell All or a Sale of Excess arrangement; system owners over 2kW may only enter into a Buy All/Sell All agreement
*** Residential systems may consume on-site; commercial systems must utilize a Buy All/Sell All arrangement

OWIA

New APUA Interconnection Policy 5KW and lower

Sale of Excess

- Allows limited self consumption
- APUA buy rate is 45 cents
- Increases payback from 5 to 9 years
- No transparency on calculation of buy rate

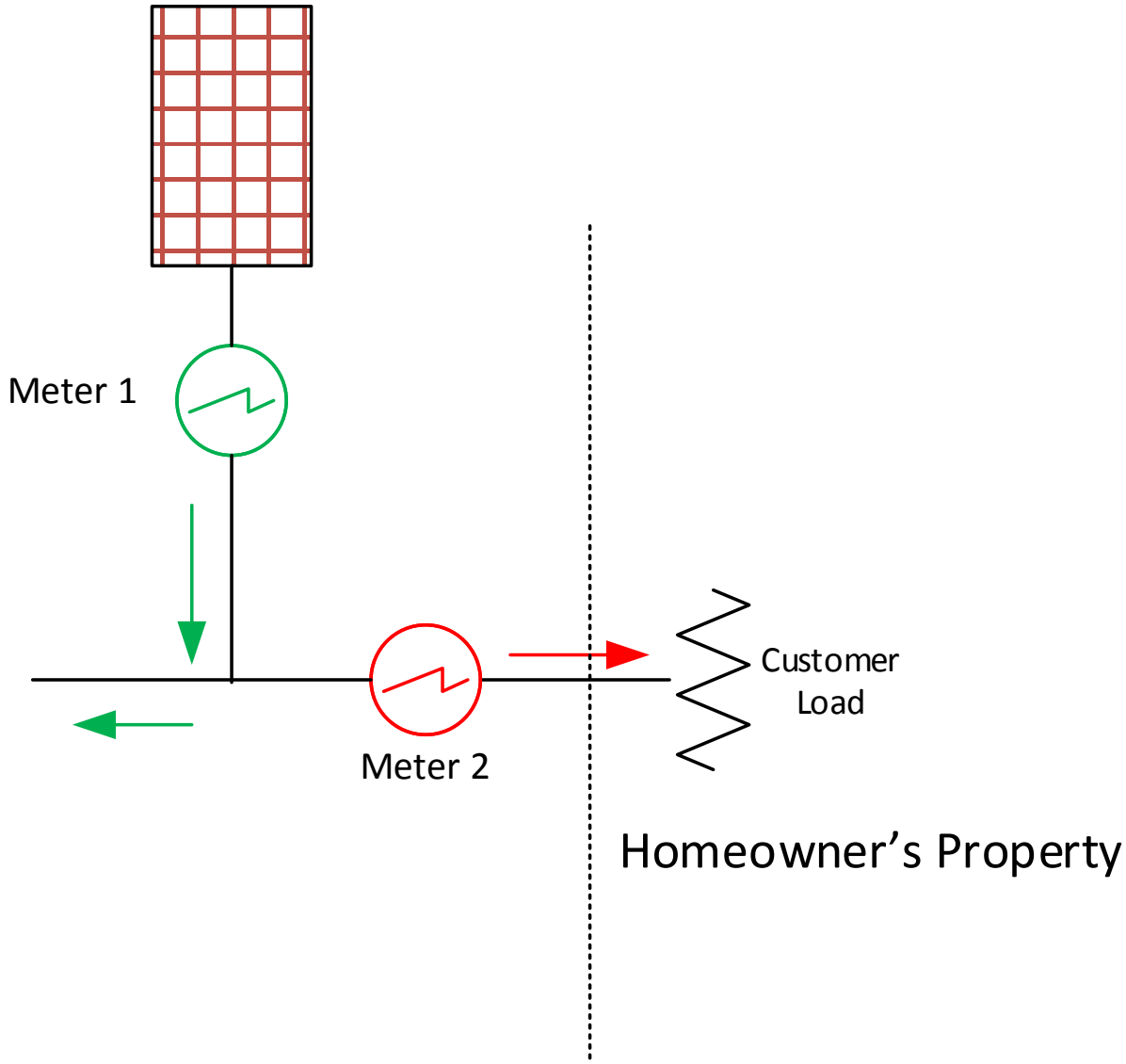


OWIA

New Interconnection Policy –Above 5kW

Buy All- Sell All

- All Energy is bought from APUA at the retail rate
- All Energy is sold to APUA at 45 cents
- No Self-consumption allowed
- Payback increased to ~12 years



OWIA

Putting the Genie Back in the Bottle

OWIA

Framing the Energy Debate/Discussion

The Environment

Energy Security

Fossil Fuel Resource limits

Macro-economic issues (e.g debt)

Jobs

Household/Business Income

Individual Rights

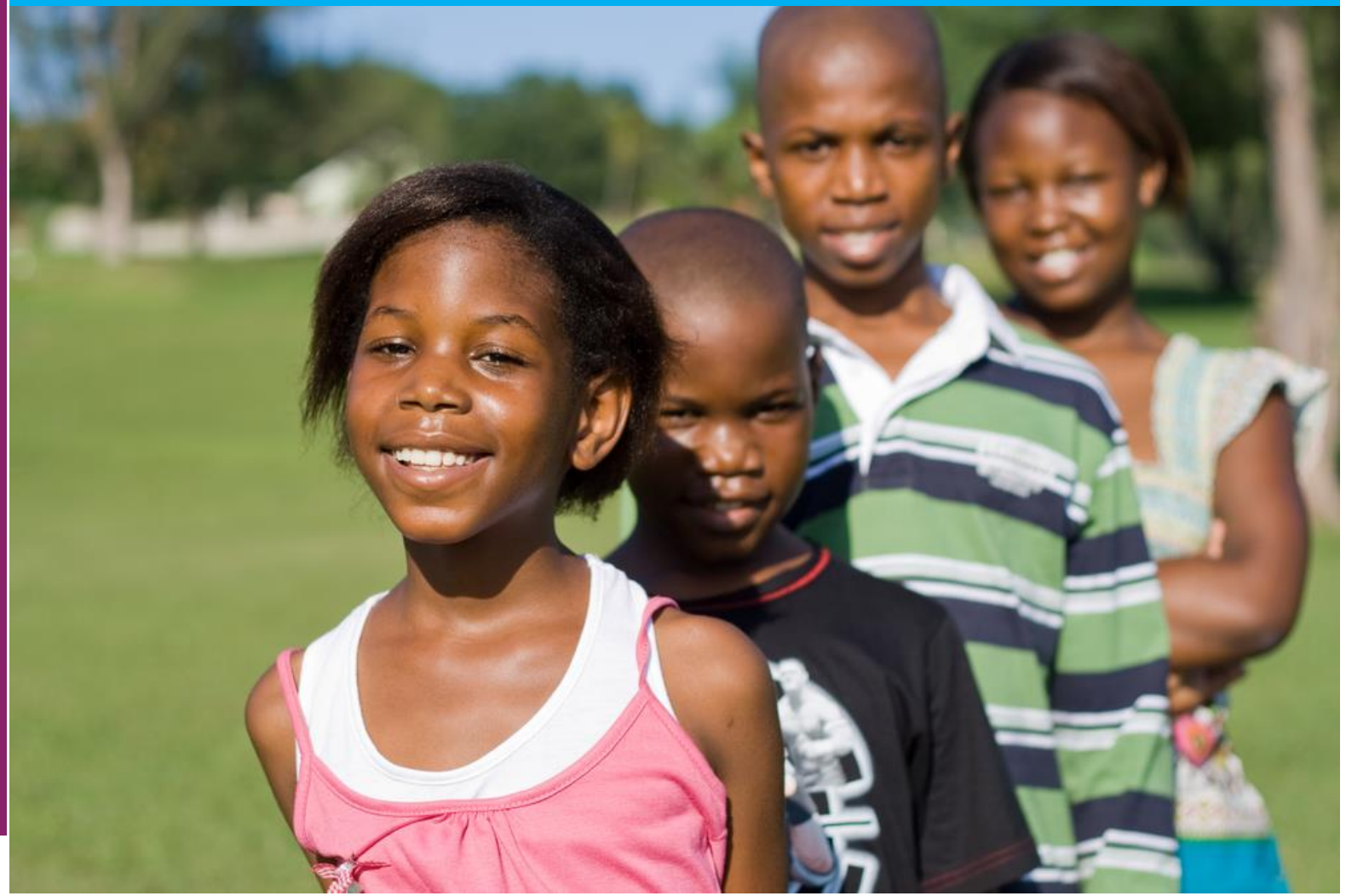
The Future

OWIA

PEOPLE POWER

a community energy scheme powered by your local council

The discussion should be about the future.



OWIA

"The BEST way to
PREDICT the FUTURE
is to
DESIGN IT."

- Buckminster Fuller